

CLAIMS:

1. A solder alloy consisting essentially of, by weight, 3.0% to 3.5% silver, greater than 1% to about 15% copper, the balance tin and incidental impurities, the alloy having an effective melting range of about 215°C to about 222°C.

2. A solder alloy according to claim 1, wherein the solder alloy has a solidus temperature in a range of about 215°C to about 218°C.

3. A solder alloy according to claim 1, wherein the solder alloy has a liquidus temperature of about 290°C or more.

4. A solder alloy according to claim 1, wherein the copper content is about 2 to about 10 weight percent of the alloy.

5. A solder alloy according to claim 1, wherein the copper content is greater than 4 weight percent of the alloy.

6. A solder alloy according to claim 1, wherein the copper content is greater than 6 weight percent of the alloy.

7. A solder alloy according to claim 1, wherein the silver content is greater than 3.0 and less than 3.5 weight percent of the alloy.

8. A solder alloy according to claim 1, wherein the silver content is 3.1 to 3.4 weight percent of the alloy.

9. A solder alloy according to claim 1, wherein the solder alloy consists of, by weight, about 3.0% silver, about 15% copper, the

balance tin and incidental impurities.

10. A solder alloy according to claim 1, wherein the solder alloy consists of, by weight, about 3.1% silver, about 12% copper, the balance tin and incidental impurities.

11. A solder alloy according to claim 1, wherein the solder alloy consists of, by weight, about 3.2% silver, about 8% to about 10% copper, the balance tin and incidental impurities.

12. A solder alloy according to claim 1, wherein the solder alloy consists of, by weight, about 3.3% silver, about 4% to about 6% copper, the balance tin and incidental impurities.

13. A solder alloy according to claim 1, wherein the solder alloy consists of, by weight, about 3.4% silver, about 2% copper, the balance tin and incidental impurities.

14. A solder alloy according to claim 1, wherein the solder alloy is in the form of a solder bump on a surface-mount integrated circuit device.

15. A solder alloy according to claim 1, wherein the solder alloy is in the form of a solder joint attaching a component to a laminate or ceramic substrate.

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16. A solder bump formed of an alloy consisting essentially of, by weight, 3.0% to 3.5% silver, about 2% to about 15% copper, the balance tin and incidental impurities, the alloy having a solidus temperature in a range of about 215°C to about 218°C, a liquidus temperature of at least 290°C, and an effective melting range of about 215°C to about 222°C.

17. A solder bump according to claim 16, wherein the copper content is greater than 4 weight percent of the alloy.

18. A solder bump according to claim 16, wherein the copper content is greater than 6 weight percent of the alloy.

19. A solder bump according to claim 16, wherein the silver content is 3.1 to 3.4 weight percent of the alloy.

20. A solder bump according to claim 19, wherein the copper content is about 2 to about 10 weight percent of the alloy.

21. A solder bump according to claim 16, wherein the alloy consists of, by weight, about 3.0% silver, about 15% copper, the balance tin and incidental impurities.

22. A solder bump according to claim 16, wherein the alloy consists of, by weight, about 3.1% silver, about 12% copper, the balance tin and incidental impurities.

23. A solder bump according to claim 16, wherein the alloy consists of, by weight, about 3.2% silver, about 8% to about 10% copper, the balance tin and incidental impurities.

24. A solder bump according to claim 16, wherein the alloy consists of, by weight, about 3.3% silver, about 4% to 6% copper, the balance tin and incidental impurities.

25. A solder bump according to claim 16, wherein the alloy consists of, by weight, about 3.4% silver, about 2% copper, the balance tin and incidental impurities.

26. A solder bump according to claim 16, wherein the silver content of the alloy is 3.3 to 3.4 weight percent of the alloy, and the copper content of the alloy is 2.0 to 4.0 weight percent of the alloy.

27. A solder bump according to claim 16, wherein the solder bump is on a surface-mount integrated circuit device.

28. A solder bump according to claim 16, wherein the solder bump is in the form of a solder joint attaching a component to a laminate or ceramic substrate.

29. A solder reflow process performed with an alloy consisting essentially of, by weight, 3.0% to 3.5% silver, greater than 1% to about 15% copper, the balance tin and incidental impurities, the process comprising the step of heating the alloy to a peak temperature of between about 240°C to about 260°C, at which the alloy reflows.

30. A solder reflow process according to claim 29, wherein the solder alloy has a solidus temperature in a range of about 215°C to about 218°C.

31. A solder reflow process according to claim 29, wherein the solder alloy has a liquidus temperature of about 290°C or more.

32. A solder reflow process according to claim 29, wherein the copper content is about 2 to about 10 weight percent of the alloy.

33. A solder reflow process according to claim 29, wherein the copper content is greater than 4 weight percent of the alloy.

34. A solder reflow process according to claim 29, wherein the copper content is greater than 6 weight percent of the alloy.

35. A solder reflow process according to claim 29, wherein the silver content is greater than 3.0 and less than 3.5 weight percent of the alloy.

36. A solder reflow process according to claim 29, wherein the silver content is 3.1 to 3.4 weight percent of the alloy.

37. A solder reflow process according to claim 29, wherein the solder alloy consists of, by weight, about 3.0% silver, about 15% copper, the

balance tin and incidental impurities.

38. A solder reflow process according to claim 29, wherein the solder alloy consists of, by weight, about 3.1% silver, about 12% copper, the balance tin and incidental impurities.

39. A solder reflow process according to claim 29, wherein the solder alloy consists of, by weight, about 3.2% silver, about 8% to about 10% copper, the balance tin and incidental impurities.

40. A solder reflow process according to claim 29, wherein the solder alloy consists of, by weight, about 3.3% silver, about 4% to about 6% copper, the balance tin and incidental impurities.

41. A solder reflow process according to claim 29, wherein the solder alloy consists of, by weight, about 3.4% silver, about 2% copper, the balance tin and incidental impurities.

42. A solder reflow process according to claim 29, wherein the process causes the solder alloy to form a solder bump on a surface-mount integrated circuit device.

43. A solder reflow process according to claim 29, wherein the process causes the solder alloy to form a solder joint attaching a component to a laminate or ceramic substrate.